CHAPTER 5: SUBJECT ATTRITION

Introduction

In this chapter, we examine the potential bias that could occur as a result of either an inmate's omission from the data collection process (those we "missed") or an inmate's refusal to participate in the research (called "refusals"). Inmates were missed — *i.e.*, omitted from the data collection process — due to logistical issues related to institutional transfers and releases.

By contrasting those inmates who did participate with those who did not (the missed and the refusals), we hope to understand the nature of any bias that may result from non-participation. This chapter examines three aspects of research participation that could result in a biased inmate sample:

- Comparison/control subjects' willingness to complete the History of Drug Use Questionnaire.[50]
- Treatment and comparison/control subjects' willingness to be research subjects.
- Treatment and comparison/control subjects' willingness to complete an Intake1[51] interview.

We did not expect bias resulting from an inmate's omission from the data collection process, because we believed that any such omission resulted from project data collection logistics rather than some systematic mechanism. Nonetheless, we felt that an understanding of this process, as well as of the refusal process, would increase our knowledge about the evaluation process and about impediments to implementing multi-site evaluations.

Research Variables

The contrasts to be examined in assessing bias resulting from subject attrition were quantified in a series of dichotomous variables. Therefore, logistic regression procedures, traditionally used for analyzing binary dependent variables, were used for these analyses (Menard, 1995). Prior to

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[50]For the sake of simplicity, in this Chapter we use the term "comparison subject" to refer to the DAP comparison subjects and the term "control subject" to refer to non-DAP control subjects.

[51] Refusals for Intake1 were examined because this was the interview essential for the analyses, as discussed in "Research Subjects" (*see* Chapter 4). Intake1 contained most of the background information used in the analyses. In contrast, the Intake2 interview contained only two variables— the DSM-III-R diagnoses of antisocial personality and depression — and was administered after the research subject had agreed to the Intake1 interview.

conducting logistic regression analyses, Chi-square tests were performed on a group of variables (drawn from the automated SENTRY database) that may have influenced an inmate's likelihood of participating in the project. For example, did an inmate's race, age, or ethnicity influence his or her likelihood of participating in the research project? If any of these variables (described below) were found to be significant in the Chi-square test ($p <= .25$), they were included in the logistic regression equations. A coefficient in the logistic regression equation was considered to be significant if the probability for that coefficient was less than or equal to .05. Results for the regression are contained in Appendix A, and a codebook of the variables used in the analyses is contained in Appendix B.

Comparison/Control Subjects — History of Drug Use (HDU) Administration

Inmates who had not participated in residential treatment while incarcerated and were between 8 and 11 months from release (in 1996, the criterion for inclusion was changed to inmates between 7 and 13 months from release) were identified as potential comparison or control subjects. Comparison/control subjects were drawn from institutions at which treatment was available (DAP sites) and from institutions that did not offer treatment (non-DAP sites). An inmate was identified as a DAP subject in this analysis if he or she was housed at a DAP site at the time he or she became a research subject.[52] This analysis was conducted on only those persons identified as potential comparison/control subjects from 1994 through 1996.[53] In addition, for a short period of time, the process of selecting comparison/control subjects involved a matching process (*see* "A Chronological History of the TRIAD Subject Selection Process," Chapter 4).

HDU questionnaires were given to potential comparison/control subjects only to determine their eligibility for inclusion in the research effort. (Note that potential *treatment* subjects were identified as such by virtue of their participation in the DAP and, therefore, did not complete the HDU questionnaire.) By refusing to complete the HDU questionnaire, comparison/control subjects essentially refused participation in the research project.

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[52] This is not to be confused with the DAP comparison/non-DAP control distinction used to differentiate the non-treatment subjects into those who had treatment available and those who did not. For comparison and control subject groupings in our analyses of outcomes, individuals were classified according to whether or not they had *ever* been housed at a DAP site when a treatment program was operational. In assessing subject attrition, we sought to understand the effects of an inmate's *current* institution (*i.e.*, the institution where the inmate was housed when approached for participation in the research project) upon his or her likelihood of participation in the research.

[53] Prior to 1994, the generation of the list of individuals selected for the History of Drug Use questionnaire administration was not automated.

A total of 4,121 male and 1,283 female inmates were identified as potential comparison/control subjects to be screened using the HDU questionnaire. Of these inmates, 3,727 men and 1,113 women were approached to complete the HDU. The remainder either did not appear at their appointments (n=90); were not in the institution (*e.g.*, were on writ) (n=9); were in special housing (n=15); were not fluent in English (n=438);[54] or were not available (n=12) to complete the survey.

HDU Refusals

When approached to complete an HDU, the inmate was notified that participation was voluntary and confidential. Of the 3,727 men identified as potential research subjects, 926 (25 percent) refused to complete an HDU. Significant differences (Chi-square) between inmates willing to take the HDU and those refusing it were found for the following variables: institution, race, ethnicity, institution security level, offense severity, prior commitments, and history of violence. These variables, along with age, were included in the logistic regression models.

Because security level and institution were linear combinations of each other and could not be entered simultaneously into a logistic regression, two models were run. The first model contained the significant variables, with the exception of institution. The second model contained institution variables, and the security-level variable was dropped.

The first model (security level) showed a better fit (Hosmer-Lemeshow Goodness of Fit = 7.65, p=0.4687) when compared with the second model (institution) (Hosmer-Lemeshow Goodness of Fit = 10.03, p=0.2632). Therefore, the results from the first model are reported below.

The logistic regression model (*see* Table A1) shows that six variables had statistically significant effects on refusal rates for male inmates: age, ethnicity, institution security level, offense severity, race, and history of violence. Inmates housed at low-security facilities were 20 percent less likely to refuse an HDU than were inmates housed in minimum-security facilities. Those inmates who had histories of serious violence were 35 percent more likely to refuse than were inmates who did not have histories of violence. Additionally, persons whose offenses were moderate or great were more likely to refuse than were those whose offenses were low/moderate (however, no effect was seen for high-severity offenses). Race and ethnicity, too, played roles in the likelihood of refusing. Black male inmates were 23 percent less likely to refuse than were white male inmates, and Hispanic male inmates were 21 percent less likely to refuse than were non-Hispanics. As the age of the inmate increased, so did the likelihood of refusing.

Of the 1,113 women approached to complete an HDU, 137 (12 percent) refused. Significant differences (as measured by Chi-square) between women who agreed and women who refused to

[54] Most of these individuals were of Hispanic origin and could not read or write English, although some could *speak* English.

complete the HDU were found for the following variables: institution, race, institution security level, offense severity, and history of violence. These variables, as well as age, were included in the logistic regression equation.

As with the model for male HDU refusals, two logistic regression models were run. The first model contained security level, with institution dropped. The second model dropped security level and added institution.

The first model (security level) showed a better fit (Hosmer-Lemeshow Goodness of Fit = 4.96, p=0.7615) than did the second model (Hosmer-Lemeshow Goodness of Fit = 10.91, p=0.2068). Therefore, the results from the first model are reported below.

Four variables have statistically significant effects on HDU refusal rates among women: race, offense severity, history of violence, and age. Black female inmates were 64 percent more likely to refuse an HDU than were white female inmates. Inmates with histories of minor violence — compared to those with no such histories — and those who committed an offense of moderate or high severity — compared with low/moderate offense severity — were almost twice as likely to refuse to complete the questionnaire. No effect was found for offenses of great severity or for histories of serious violence. The older the inmate, the more likely she was to refuse (*see* Table A2).

Comparing the results between men and women, it is evident that although many of the same variables were significant, the "direction" of the relationship was not always the same. Where black men were less likely than white men to refuse completing the HDU survey, black women were more likely than white women to refuse completing this survey. Furthermore, male inmates with a history of *serious* violence were more likely to refuse, whereas female inmates with a history of *minor* violence were more likely to refuse.

Attrition of Identified Research Subjects

Once the comparison subjects who had self-reported drug use histories and treatment subjects who entered a DAP were identified for data collection, subject attrition resulted either from subjects not being approached for data collection or from subjects refusing to participate. Table 1 summarizes this attrition process, and the process is examined in detail at the conclusion of this chapter.

Once both treatment and comparison subjects had been identified, researchers visited their sites to conduct surveys; however, not all subjects identified initially were able to participate in the research effort. Between the time an individual was identified as a research subject and the time a researcher was scheduled for the return trip to that institution to collect data, some research subjects were no longer housed at the institution due to such events as transfers to other institutions, absences due to writs, and releases to CCC's or from BOP custody. Other inmates

had to be excluded from the research pool because they were under special housing restrictions;[55] others were excluded because they had illnesses. A logistic regression was performed to analyze possible differences between those persons who were not available for research participation (*i.e.*, "missed") and those who were.

Subjects Who Were Missed as Research Subjects

A total of 2,459 male inmates were identified as research subjects. Of those, 378 (15 percent) were missed. The following variables had significant differences for those inmates who were missed as research subjects compared with those subjects who were included in the subject pool (Chi-square): status as comparison vs. treatment subject, being housed at a DAP vs. non-DAP site, ethnicity, institution, and race.

These variables (excluding specific institution) along with age were included in the regression analysis. Site was not included in the regression model because of zero cells. The proportion of male inmates across the 34 sites who were missed ranges from 0 to 52 percent.

The logistic regression (*see* Table A3) showed significant effects for status as comparison vs. treatment subject, and for DAP vs. non-DAP site. Male subjects identified at non-DAP sites were nine percent less likely to be missed than were inmates housed at DAP sites. Comparison subjects were 344 percent more likely to be missed than were treatment subjects.

Of the 571 female inmates who were approached to participate in the research project, 22 percent (n=127) were missed. Chi-square tests showed significant differences on the following variables between those persons approached for research and those who were missed: status as comparison vs. treatment subject, institution, institution security level, being housed at a DAP vs. non-DAP site, offense severity, and prior commitments. These variables (along with age), excluding the variables DAP vs. non-DAP site and institution, were included in the logistic regression equation. The variable DAP vs. non-DAP site could not be included because no one at a non-DAP institution was missed (23 percent [n=127] of the women at DAP sites were missed). Institution could not be included in the regression because of zero cells. The proportion of female inmates missed ranged from 0 to 31 percent, across seven sites.

Two variables were significant in the regression (*see* Table A4): status as comparison vs. treatment subject, and security level. Comparison subjects were 214 percent more likely to be missed for research than were treatment subjects, and inmates housed at low-security institutions were 67 percent more likely to be missed than were those housed at minimum-security institutions.

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[55] Detention in a special housing unit segregated from the general population occurs for administrative reasons and as a sanction for disciplinary infractions.

Comparison subjects were more likely to be missed, for both men and women. This can be attributed primarily to the logistics of planning data collection trips. The first priority during data collection trips was placed upon cohorts newly admitted to DAP's and upon graduating cohorts. DAP participant data collection required adherence to specified time frames for administering the surveys and interviews at the beginning and end of treatment for the data serving as pre- and post-treatment measures. Identification of comparison subjects occurred close to those subjects' release dates (approximately one year from release), and at the time of selection it was unknown whether these individuals would receive CCC placements. Therefore, it was more likely that these subjects would be missed; by the time a trip to that site occurred for DAP subject data collection, some of the individuals selected as comparison subjects would likely already have been released to CCC's.

Research Refusals

Once inmates were identified as research subjects — either as DAP participants or as comparison subjects through the HDU — and were available to participate, they were asked to complete two interviews and various surveys. Inmates were reminded that participation in the research was voluntary, and they signed informed consent forms.

Of the 2,081 male inmates who were approached to participate in the research, 223 (11 percent) refused. A logistic regression was run to examine differences between those subjects who participated and those who refused.

The following variables were significant by Chi-square and were included in the regression model: status as comparison vs. treatment subject, being housed at a DAP vs. non-DAP site, ethnicity, prior commitments, race, and history of violence. Institution also was significant, but was not included because of too many zero cells**.** Refusals for research ranged from 0 to 44 percent across the 34 sites.

The only significant variable in the regression equation (*see* Table A5) for men refusing research was the variable denoting type of research subject. Comparison subjects were 160 percent more likely to refuse to complete the research surveys as were treatment subjects.

A total of 444 female inmates were approached to participate in the research. Of those, only 27 (6 percent) refused to complete any of the research forms. Because the number of women who refused was small, no regression equation was performed.

Intake1 Missing and Refusals

Inmates who agreed to participate in research were asked to complete two interviews. As mentioned in the previous chapter, "Research Subjects" (*see* Chapter 4), only those individuals

who had completed the Intake1 interview were included in the analyses. Therefore, analyses were conducted to examine characteristics of those persons who missed the Intake1 interview and those who refused to complete it.[56]

A segment of comparison inmates (75 men and 7 women) was interviewed at halfway houses rather than at institutions. They have been added to the comparison sample for the Intake1 interview analyses. A halfway house category was added to the following variables: being housed at a DAP vs. non-DAP site, institution, and security level.

Out of the 1,933 men to be interviewed, 149 (8 percent) were missed. Chi-square significance was found for the following variables: being housed at a DAP vs. non-DAP site, status as a comparison vs. treatment subject, institution, and security level. Institution could not be included in the regression because of too many zero cells. The range of those who missed the Intake1 interview was 0 to 29 percent, across 35 sites.

A regression equation was attempted with the remaining significant variables. However, due to quasi-complete separation in the sample points and linear combinations of variables, a regression equation could not be estimated. Because no halfway house subjects were missed, deleting them from the regression equation allowed for an analysis of persons missed for the remaining sites.

Significant values were found for the DAP vs. non-DAP site and comparison vs. treatment subject variables. These variables, along with age, were included in the regression equation. Age was not related significantly to the likelihood of being missed. Subjects at non-DAP sites were 84 percent less likely to be missed than were subjects at DAP sites. Additionally, comparison subjects were 50 percent less likely to be missed than were treatment subjects (*see* Table A6).

We can conjecture that the lower rate of missed Intake1 interviews among comparison subjects — in particular those from non-DAP sites — can be attributed to the logistical procedures involved in data collection. During the in-prison data collection phase of the evaluation project, research staff were located at as many as six different DAP research sites.[57] At these sites, the logistics of data collection did not require all data to be collected during a single week. However, at many DAP sites and all non-DAP sites, data collection required a special trip by a field researcher. Therefore, comparison subject data, most notably at non-DAP sites, tended to be collected during a week-long data collection trip to the site. This resulted in a decreased likelihood of missing the Intake1 interview in the case that the individual had been transferred or released.

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[56] Please note that although some subjects initially had agreed to participate in the evaluation project, some later refused participation in one or more survey or interview.

[57] The specific sites varied at different times of the project.

Seven percent (n=29) of 424 female inmates were missed when the Intake1 interviews were being administered. Due to the small number missed, regression equations were not performed.

Refusal Rates for Intake1 Interview

Refusal rates for the Intake1 interview were low for both men (2 percent, n=40) and women (less than 1 percent, n=3), so regression equations were not performed.

Summary of Results for Subject Attrition

It is apparent from Table 1 that the subject attrition problem was most pronounced at the point when the pool of potential comparison subjects was being identified. Not only was the refusal rate highest at this point, but this was the only point at which characteristics of individuals were predictive of refusal. Among men, there were significant effects for race, ethnicity, offense severity, age, and history of violence. Among women, there were significant effects for the same variables except ethnicity, although the "direction" of the relationship was not always the same. It must be noted that all the factors found to be predictive of HDU refusal rates were used as control variables in the analyses of results.

At all other times during the process of data collection, it is clear that subject attrition was attributable solely to administrative causes. For example, the greater rate of missing data collection for comparison subjects was due to the fact that it was logistically more difficult to approach all subjects identified because there was a much shorter time frame within which to coordinate data collection trips for comparison subjects.[58]

[58] We are collecting arrest outcome information for subjects who refused to be interviewed and for subjects who were "missed" due to administrative reasons. Future analyses will examine whether the arrest rate of these individuals differ from those included in our analyses, controlling for the background characteristics available from automated data files.